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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

First Named Inventor: BRIERS, JORIS

Application No.: 10/702342

Confirmation No.: 8096

Filed: November 6, 2003

Title: MELT PROCESSABLE COMPOSITIONS

**AFFIDAVIT UNDER 37 C.F.R. § 1.132**

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**CERTIFICATE OF MAILING OR TRANSMISSION (37 CFR § 1.8(a))**

I hereby certify that this correspondence is being:

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- ☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at 571-273-8300.
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Date

Signed by: K.J. Roßberg

Dear Sir:

I, Dr. Claude Lavallée, being duly sworn, do hereby depose and state that:

1. I hold a Bachelor of Science Degree in Chemistry, granted to me by the Laval University, Quebec, Canada in 1981.
2. I hold a Doctorate in Physical Chemistry (polymer research) from Laval University, Quebec, Canada granted to me in 1987.
3. I was employed as a Research Associate at the National Research Council of Canada in Ottawa, Ontario from 1987-1988 and in Boucherville, Quebec from 1988-1992.
4. I was employed at 3M Canada Company, London, Ontario from 1992-2006 for the purpose of conducting research.
5. Since 2006, I have been employed at Dyneon LLC, a wholly owned subsidiary of 3M Company, located in Oakdale, MN in a capacity for research and development of new processing additives for thermoplastics.
6. I am a representative of the current assignee of interest because the inventors are not currently available.

7. I have read and am familiar with the patent application identified as U.S. Application No. 10/702,342.

8. In U.S. Application No. 10/702,342, four commercially available fluoropolymers are used as a polymer processing additive (PPA): Dynamar™ FX-5920A, Dyneon™ PVDF 11012, Dyneon™ PVDF 31508, and Dyneon™ PVDF 1015. Dynamar™ FX-5920A is referred to as the standard fluoropolymer processing additive [0053]. Dyneon™ PVDF 1015 is a homopolymer of VDF (Table 1). Dyneon™ PVDF 11012 is a VDF/HPF copolymer and Dyneon™ PVDF 31508 is a VDF/CTFE copolymer (Table 1). Examples 1-6 of the present application use either Dyneon™ PVDF 11012 with poly(oxyalkylene) polymer or Dyneon™ PVDF 31508 with poly(oxyalkylene) polymer as a polymer processing additive.

9. Samples of Dyneon™ PVDF 11012, Dyneon™ PVDF 31508, and Dyneon™ PVDF 1015 each were analyzed for molecular weight distribution using gel permeation chromatography (GPC) as follows.

*Sample preparation:* A 10.0 ml aliquot of dimethylformamide containing 0.05M lithium bromide was added to approximately 25.0 mg of the sample. The sample solutions were shaken overnight to dissolve the sample. The sample solutions were then filtered with a 0.25 micron nylon syringe filter.

*Sample Analysis:* A chromatograph (Alliance® 2695 Separations Module, Waters Corp., Milford, MA) with a column (PLgel 10µm MIXED-B, 300mm x 7.5mm, Polymer Laboratories, Varian, Inc., Amherst, MA) and refractive index detector (RID-10A, Shimadzu Scientific Instruments, Columbia, MD) was used. A 100 µL aliquot of sample solution was injected. Dimethylformamide containing 0.05M lithium bromide was used as the eluent. The analysis was run at 35°C. Narrow dispersity polystyrenes (EasiCal® PS-1, Polymer Laboratories, Varian, Inc., Amherst, MA) ranging in molecular weight from  $7.50 \times 10^6$  to 580 were used for calibration. Calculations were completed with Cirrus GPC software (Polymer Laboratories, Varian, Inc., Amherst, MA).

10. The gel permeation chromatograms for each of the samples and a blank are shown in FIG. 1 (note: chromatograms are offset in the y-axis for display purposes). The peak of interest for each of the samples is plotted as  $dW/d\log M$  versus  $\log M$  as shown in FIG. 2.

FIG. 1

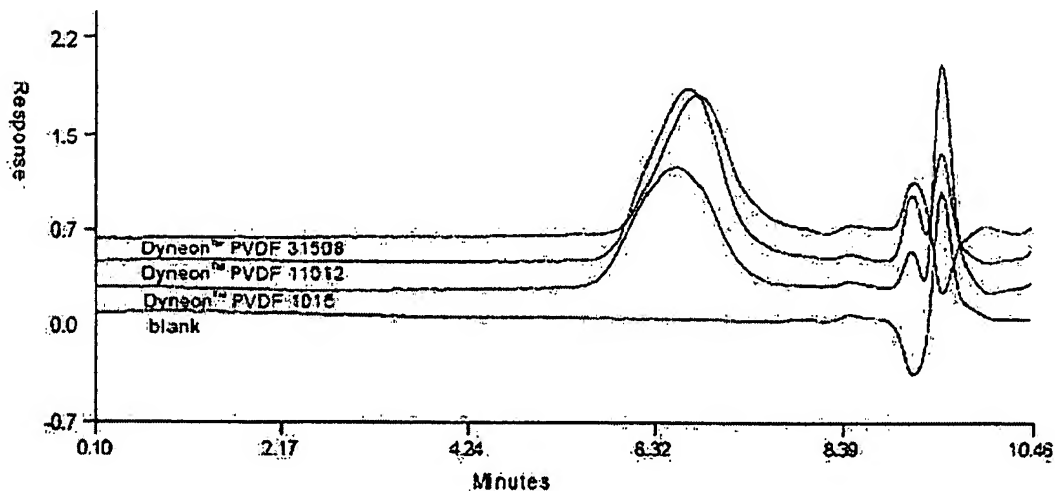
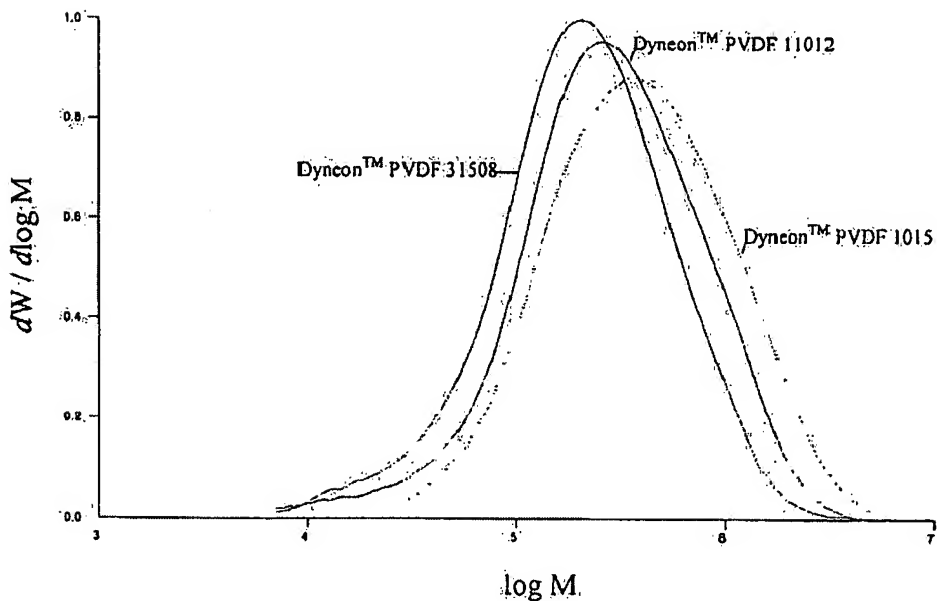


FIG. 2

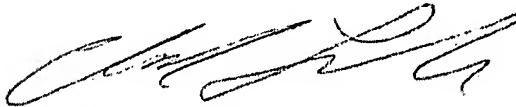


11. The results of the GPC analysis show Dyneon™ PVDF 11012, Dyneon™ PVDF 31508, and Dyneon™ PVDF 1015 are unimodal polymers. FIG. 2 above shows the unimodal molecular weight distribution for each sample.

12. The undersigned declares further that all statements made herein of his own knowledge are true, and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful, false statements and the like are punishable by a fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

Further Affiant sayeth not.

State of Minnesota     )  
                                  ) ss.  
County of Ramsey     )



Claude Lavallée

Sworn to and subscribed before me by  
the above-named applicant this  
12th day of October, 2007.

  
\_\_\_\_\_  
Notary Public

